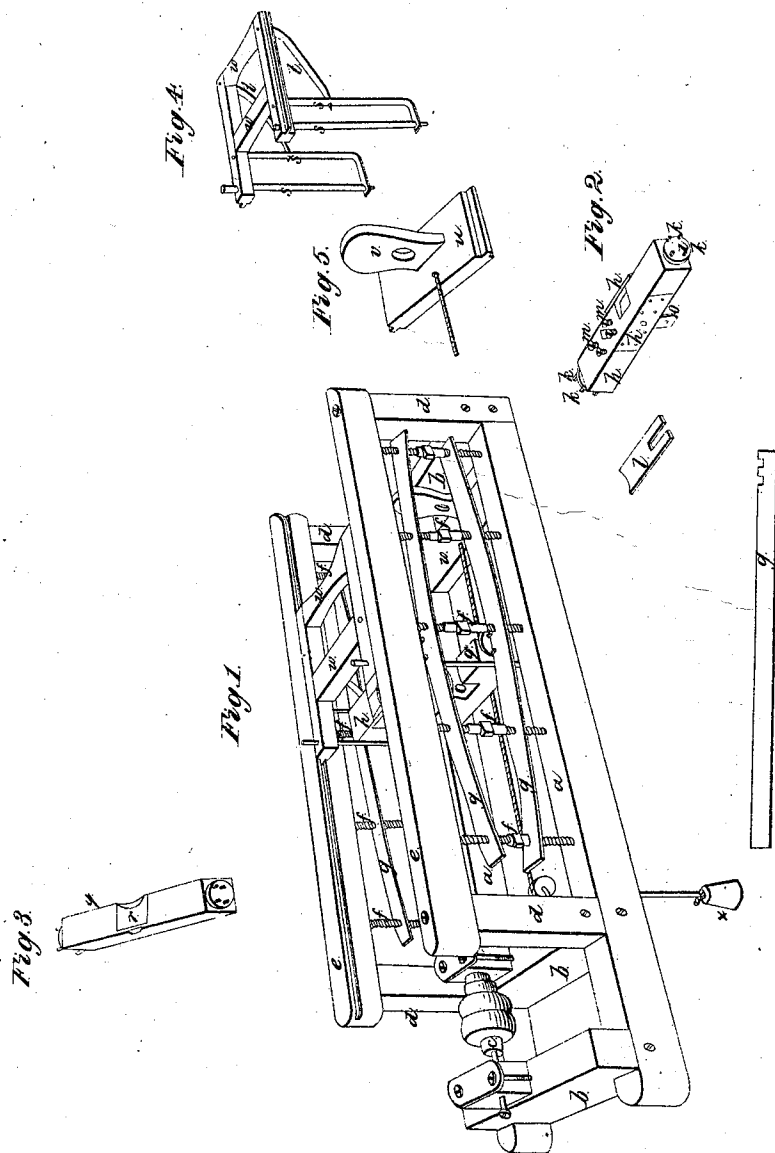


No. 43.

*E. & N. Alford,
Gage Lathe.*

Patented Oct. 11, 1836.



UNITED STATES PATENT OFFICE.

ENOS ALVORD AND NELSON ALVORD, OF WESTFIELD, MASSACHUSETTS.

LATHE FOR TURNING, &c.

Specification of Letters Patent No. 43, dated October 11, 1836.

To all whom it may concern:

Be it known that we, ENOS ALVORD and NELSON ALVORD, of Westfield, in the county of Hampden and State of Massachusetts, have invented a new and improved machine or lathe adapted to the turning of a great variety of articles, both large and small, whether they are required to be cylindrical, regularly tapering, or to be bulged or swelled in one or more parts—such, for example, as gaffs for the sails of vessels, whip-stocks, ramrods, &c.; and we do hereby declare that the following is a full and exact description thereof, reference being had to the drawing accompanying and making a part of this specification.

This machine must necessarily vary in size according to the purpose to which it is to be applied, and its frame work may be differently constructed while the principle upon which it operates will remain unchanged, but for the purpose of description, we have taken, and given the dimensions of the parts of a medium size, which we have constructed, and used, and which we have found to answer well in practice.

In the drawing, *a, a, b, b, d, d, and e, e,* represent the frame work of the machine, *a, a* are two sills five feet and a half long three inches high, and two inches thick.

b, b, b, are three cross sills, one foot long from inside to inside, five and a half inches high, and two inches thick, they consequently rise two and a half inches above the side sills, and this is done for the purpose of passing a bolt through them and through the posts *d, d.* These four posts are five inches long from shoulder to shoulder, and are two inches square. The plates *e, e,* constituting the top of the frame, are two inches thick, and three wide. The mandrel *c* is fixed in the ordinary way of fixing mandrels in collier and mandrel lathes, and so that its axis shall correspond with a center line between the sills and the plates. The two head sills *b, b,* are fourteen inches apart which allows a good length for the mandrel.

Screw rods or bolts *f, f, f,* extend from the side sills to the plates on each side of the frame, as shown in the drawing. The ends of these bolts are formed into pivots which pass into, and revolve in bushed holes in the sills, and plates, five such bolts on each side we deem sufficient for a machine of the size described. These bolts may be

five-eighths of an inch in diameter, in the middle they are made square for about half an inch in length for the purpose of turning them by means of a wrench, they are tapped at one end with a right handed, and at the other with a left handed screw, the threads of which must be equal, and extend from the pivots to the square. Elastic strips of steel or other metal *g, g,* two inches wide, and one-fourth of an inch thick are drilled and tapped so as to correspond with the screws on the bolts which pass through them, and by being turned determine the distance of these strips from each other for the purpose to be presently described.

The piece marked *h,* and shown separately in Figure 2, we denominate the jack, it is made of timber three inches square, and its length is such as to fill the space between the opposite strips *g, g,* by which it is to be guided in its passage along the machine. It has on each end a plate of metal, *i,* which may be a circular disk of cast-iron, half an inch thick, and three inches in diameter, on each of these plates there are four projecting pins, *k, k, k, k,* placed in pairs at the opposite edges, the two forming a pair being one-fourth of an inch apart, so as to embrace the strips *g, g,* between them, the jack thus constructed when placed between these places, and embracing them by its pins may be made to slide along them, and will adapt it to such sinuosity, or curvature as may be given to them:— Upon the under side of the jack a cutter *b,* is fixed which cutter is curved, and answers the purpose both of a gouge, and chisel in the operation of turning, it lies along the face of the jack to which it is affixed by a screw, in its notch, the cutting edges being immediately under the throat *n,* through which the turnings are delivered. *M, M, M,* are set screws which bear against and regulate the cutter.

There is a second piece of timber similar in size to the jack, and armed at each end in like manner with plates, and pins fitting on the lower steel plates, and forming a counter to the jack, as the piece to be turned is embraced between them. An excavation *r* is made on the upper face of the cut to receive the article to be turned. It is in form like the half of a trumpet mouth, admitting at its longer part the unturned article, and by its smaller, confining it when turned. The piece marked *O,* on the jack is an iron rest, or cheek piece, which is made to bear

against and steady the stuff as it is turned. In the machine described it is four inches long, one inch wide, and half an inch thick; it turns upon a pivot, supported by an iron plate at *p*. Its lower end passes into a notch, or excavation in the cat so formed as to cause the rest to approach toward or to recede from the piece turned, as it becomes altered in diameter by the approach or retreat of the jack, and cat, from the action of the guides *g, g*. The cross excavation on the cat, before spoken of, is faced with, or consists of iron, and upon the face of the jack opposite to the edge of the cutter there is a projecting piece of iron, similar in form to one half of the excavation in the cat, and corresponding with it.

The part called *w, w*, is called the slide, and is shown separately in Fig. 4. Its upper part consists of a frame about one foot square which is furnished with tongues that fit into grooves on the inner edges of the plates *e, e*, as shown in the drawing. *S, S, S, S*, are parallel iron rods half an inch in diameter and three inches apart, so placed as to embrace the plates, or disks *i, i*, on either end of the jack, and cat between them; *t, t*, are braces to steady them. Between these rods the jack and cat can traverse up, and down, and vibrate to the extent required as they pass along the steel guides. The part *u*, as shown separately in Fig. 5, we call the catch, as its office is to hold, and steady the part of the article which has been turned; it runs in grooves in the sills, its standard, or upright, *v*, having a hole in it sufficiently large for the intended purpose. It is brought up by the weight *X*, and its structure and use are too obvious to require further description.

Operation: When the article to be turned is intended to be cylindrical or of the same diameter from end to end the screw-bolts *f, f*, are so turned that the guide strips *g, g*, shall be parallel to each other, and at such distance apart as shall correspond with the

intended size of the article, one end of which is then fixed in a suitable chuck, and the slide *w, w*, Fig. 4, carrying the jack, and cat, the pins, on the ends of which embrace the guide strips, is made to advance by hand so as to receive the piece to be turned between the notch in the cat, and the cutter, and by continuing to advance the slide the turning is effected. When the jack has arrived close against the chuck it may be lifted out, and the turned piece removed, the upper guide strips having notches made in them to allow the lower pins which embrace the strip to pass through.

When the piece to be turned is to be taper or of variable diameter the guide strips must be so set as to produce the desired form, as the ends of the guide strips must draw in when they do not stand parallel to each other it will be found best, in order to prevent bending, or cramping in setting to allow the screw bolts *f, f*, one of them excepted to work in bushes that are in some degree ovaling lengthwise of the frame, without giving lateral play. Instead of constructing the machine with a mandrel as described this part may be omitted, and the frame with its appendages may be adapted to any suitable turning lathe.

What we claim as our invention, and wish to secure by Letters Patent is—

The manner of fixing, and adjusting the guide strips, and of combining with them the parts which we have called the jack, and the cat with their appendages, constructed and operating substantially in the manner described.

The machine as above described is made of wood, steel, and iron, and may be wholly made of metal.

ENOS ALVORD.
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Witnesses:

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AUGUSTUS COLLINS.